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## **Lack of recovery of muscle proteins lost after food deprivation in old rats despite a stimulation of muscle protein synthesis**

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3) In the small intestine, as in liver, post-prandial FSR increase is observed with both diets, and as in muscle, a high protein diet increases FSR only during the fed state.

**Lack of recovery of muscle proteins lost after food deprivation in old rats despite a stimulation of muscle protein synthesis.**

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Sarcopenia could be the result of an inability of elderly people to recover muscle proteins lost during catabolic periods. To test this hypothesis, we deprived 12- and 24-month-old rats of food for 10 days and compared their capacity to recover after 5 days of refeeding. We measured gastrocnemius muscle protein synthesis rates in vivo using the flooding dose method ( $^{13}\text{C}$ -valine), and calculated degradation rates. Results ( $\pm$  SE) were analysed by the Duncan test

( $P \leq 5\%$ ; <sup>a,b</sup> nutrition effect per age; \* age effect):

Muscle protein mass, reduced after fasting, increased during refeeding in adults. In old rats, mobilization was similar but there was no recovery. During fasting, ribosomal capacity was maintained, whereas ribosomal efficiency, fractional and absolute synthesis rates were decreased and increased back to control values during refeeding, whatever the age. Protein degradation rates were significantly reduced during fasting in adults and increased slightly after refeeding. They were unchanged in the old rats, being equal in fed and refed animals.

Conclusions: 1) The capacities to recover muscle mass lost after a stress decreased with age. 2) This lower capacity does not seem to be related to a lack of stimulation of protein synthesis. 3) It could result from an alteration in the inhibition of proteolysis, which remained high during refeeding.

	12 months			24 months		
	Fed (6)	Unfed (6)	Refed (5)	Fed (6)	Unfed (7)	Refed (6)
Total protein (mg)	522 $\pm$ 15 <sup>a</sup>	424 $\pm$ 12 <sup>b</sup>	462 $\pm$ 20 <sup>ab</sup>	345 $\pm$ 44 <sup>a*</sup>	273 $\pm$ 23 <sup>a*</sup>	266 $\pm$ 21 <sup>a</sup>
Rib capacity (mg RNA/g prot)	5.7 $\pm$ 0.1 <sup>a</sup>	5.2 $\pm$ 0.4 <sup>a</sup>	5 $\pm$ 0.1 <sup>a</sup>	5.9 $\pm$ 0.4 <sup>a</sup>	5.8 $\pm$ 0.4 <sup>a</sup>	6.7 $\pm$ 0.5 <sup>a*</sup>
Fractional synth. rates (%/d)	4.9 $\pm$ 0.2 <sup>a</sup>	2.7 $\pm$ 0.4 <sup>b</sup>	5.2 $\pm$ 0.2 <sup>a</sup>	7.8 $\pm$ 0.5 <sup>ab*</sup>	6.5 $\pm$ 0.6 <sup>b*</sup>	9 $\pm$ 0.5 <sup>a*</sup>
Absolute synth. rates (mg prot/d)	26 $\pm$ 2 <sup>a</sup>	11 $\pm$ 2 <sup>b</sup>	24 $\pm$ 1 <sup>a</sup>	26 $\pm$ 3 <sup>a</sup>	17 $\pm$ 1 <sup>b*</sup>	23 $\pm$ 1 <sup>a</sup>
Rib effic. (mg prot/ (mg ARN.d))	9 $\pm$ 1 <sup>a</sup>	5 $\pm$ 1 <sup>b</sup>	10 $\pm$ 0.4 <sup>a</sup>	13 $\pm$ 1 <sup>a*</sup>	12 $\pm$ 1 <sup>a*</sup>	13 $\pm$ 0.4 <sup>a*</sup>
Degradation rates (%/d)	5 $\pm$ 0.2 <sup>a</sup>	3.4 $\pm$ 0.5 <sup>b</sup>	4 $\pm$ 0.1 <sup>ab</sup>	7.7 $\pm$ 0.5 <sup>a*</sup>	8 $\pm$ 0.8 <sup>a*</sup>	7.7 $\pm$ 0.4 <sup>a*</sup>